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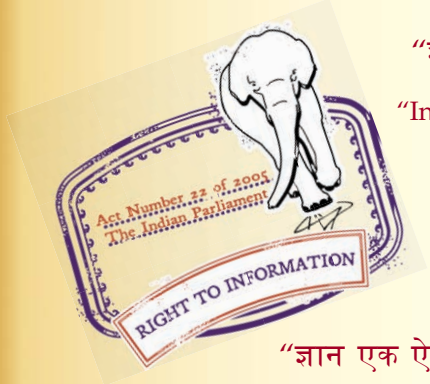
IS 7809-3-2 (1981): Pressure sensitive adhesive tapes for electrical purposes, Part 3: Specifications for individual materials, Section 2: Requirements for polyester film tapes (PETP) with thermosetting adhesive [ETD 2: Solid Electrical Insulating Materials and Insulation Systems]



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"Knowledge is such a treasure which cannot be stolen"

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IS : 7809 (Part III/Sec 2) - 1981

(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR PRESSURE SENSITIVE ADHESIVE TAPES FOR ELECTRICAL PURPOSES

PART III SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 2 Polyester Film Tapes (PETP) with Thermosetting Adhesive

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PART III SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 2 Polyester Film Tapes (PETP) with Thermosetting Adhesive

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Indian Standard

SPECIFICATION FOR PRESSURE SENSITIVE ADHESIVE TAPES FOR ELECTRICAL PURPOSES

PART III SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 2 Polyester Film Tapes (PETP) with Thermosetting Adhesive

0. FOREWORD

0.1 This Indian Standard (Part III/Sec 2) was adopted by the Indian Standards Institution on 17 July 1981, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 A series of standards is being brought out on pressure sensitive adhesive tapes for electrical purposes. This series covers the following in various parts:

a) General requirements,

b) Methods of test, and

c) Specifications for individual materials.

0.3 This standard (Part III/Sec 2) covers requirements for polyester film tapes (PETP) with thermosetting adhesive.

0.4 This standard should be read in conjunction with IS : 7809 (Part I)-1975* and IS : 7809 (Part II)-1977†.

0.5 In the preparation of this standard, assistance has been derived from IEC Doc: 15C (Central Office) 105 'Draft specification for pressure-sensitive adhesive tapes for electrical purposes, Part 3 Specifications for individual materials. Sheet 2 Polyester film tapes (PETP) with thermo-setting adhesives', issued by the International Electrotechnical Commission.

*Specification for pressure sensitive adhesive tapes for electrical purposes: Part I General requirements.

†Specification for pressure sensitive adhesive tapes for electrical purposes: Part II Methods of test.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part III/Sec 2) covers the requirements for pressure sensitive adhesive tapes made of polyester film with thermosetting adhesive.

NOTE — The thermosetting adhesives used for these tapes are normally based on natural or synthetic rubber or synthetic resin.

2. DESIGNATION

2.1 Designation of the product is F-PETP/130/T_s in accordance with **3** of IS : 7809 (Part I)-1975†.

3. GENERAL REQUIREMENTS

3.1 General — The material shall conform to the requirements stated in IS : 7809 (Part I)-1975†.

3.2 Width — The measured width shall be in accordance with **6.2** of IS : 7809 (Part I)-1975†.

3.3 Length — The measured length shall be in accordance with **6.3** of IS : 7809 (Part I)-1975†.

3.4 Thickness — The thickness shall be measured in accordance with **3** of IS : 7809 (Part II)-1977‡. The preferred thickness shall be in the range, 0·02 to 0·1 mm. The tolerance on thickness shall be 15 percent or 0·01 mm whichever is the greater.

4. PERFORMANCE REQUIREMENTS

4.1 The performance requirements when tested according to the relevant method shall conform to the requirements given in Table 1.

NOTE — It should be understood that the values given are minimum values of the central value obtained as a test result [*see* **2.12** of IS : 9335 (Part I)-1979§].

*Rules for rounding off numerical values (*revised*).

†Specification for pressure sensitive adhesive tapes for electrical purposes: Part I General requirements.

‡Specification for pressure sensitive adhesive tapes for electrical purposes: Part II Methods of test.

§Specification for cellulosic papers for electrical purposes: Part I Definitions and general requirements.

4.2 Thermal Endurance

4.2.1 When required by the purchaser, the supplier shall provide evidence when tested in accordance with 7 of IS : 7809 (Part II)-1977*, the tape has a temperature index [*see* **11.1.1** of IS : 8504 (Part I)-1977†] of not less than 130. The exposure temperature shall be 150°C, 160°C and 180°C.

4.2.2 The end point criterion used is breakdown voltage of 35 kV/mm of initial thickness. The electrode for testing electric strength shall be a metal foil. The results on a particular tape continue to be valid until a change is made in the composition or method of manufacturing.

NOTE — Consideration is being given to thermal endurance tests using mechanical properties to determine life.

TABLE 1 SCHEDULE OF CHARACTERISTICS

(*Clause* 4.1)

SL NO.	PROPERTY	TEST METHOD CLAUSE	UNIT	REQUIREMENTS
1.	Electrolytic corrosion after 24 hours at 27 ± 2°C and 93 ± 2 percent relative humidity	4 of IS : 7809 (Part II)-1977*	Ohm	1×10^{11} minimum central value
2.	Thermal endurance	7 of IS : 7809 (Part II)-1977*		Temperature index not less than 130
3.	Bond separation during thermal treatment (flagging test) for time and temperature specified by manufacturer	8.3 of IS : 7809 (Part II)-1977*	mm	Maximum end lifting 2
4.	Bond separation after thermal treatment at temperature specified by manufacturer	8.2 of IS : 7809 (Part II)-1977*		Weight still suspended on each specimen (*see* Notes 1 and 2)
5.	Tensile strength	9 of IS : 7809 (Part II)-1977*	N/10 mm	600 minimum per mm thickness
6.	Elongation at break	9 of IS : 7809 (Part II)-1977*	Percent	75 minimum

(*Continued*)

*Specification for pressure sensitive adhesive tapes for electrical purposes: Part II Methods of test.

†Guide for determination of thermal endurance properties of electrical insulating materials: Part I Temperature indices and thermal endurance profiles.

TABLE 1 SCHEDULE OF CHARACTERISTICS — *Contd*

Sl No.	Property	Test Method Clause	Unit	Requirements
7.	Adhesion to steel	**10.3.2** of IS: 7809 (Part II)-1977*	N/10 mm	2 min for thickness up to 0·02 mm 3 min for thickness over 0·02 mm
8.	Adhesion to backing	**10.3.3** of IS: 7809 (Part II)-1977*	N/10 mm	2 minimum central values
9.	Shear adhesion to backing after liquid immersion	**11** of IS: 7809 (Part II)-1977*	N/10 mm	12 minimum (*see* Note 3)
10.	Electrical strength — i) At room temperature	**12** of IS: 7809 (Part II)-1977*	kV/mm	70 minimum
	ii) After humid conditioning 24 h at 27 ± 2°C and 93 ± 2 percent relative humidity	**13** of IS: 7809 (Part II)-1977*	kV/mm	70 minimum

NOTE 1 — The curing time and curing temperature are subject to agreement between the manufacturer and user. After the agreed curing treatment, the weight of 500 g is attached to each specimen in the oven, while the oven is maintained at the curing temperature.

NOTE 2 — It is expected that the flagging test will eventually become the only test for this property.

NOTE 3 — The solvent to be applied should be 75 percent hexane, 25 percent toluene.

*Specification for pressure sensitive adhesive tapes for electrica purposes: Part II Methods of test.

INDIAN STANDARDS

ON

SOLID ELECTRICAL INSULATING MATERIALS

IS:

350-1968 Organic, baking, impregnating, insulating varnishes for electrical purposes (*first revision*)

352-1973 Air-drying insulating varnishes for electrical purposes (*first revision*)

1271-1958 Classification of insulating materials for electrical machinery and apparatus in relation to their thermal stability in service

1576-1967 Solid pressboard for electrical purposes

1951-1961 Polyvinyl chloride sleeving for electrical purposes

2188-1962 Methods of test for paper for electrical purposes

2259-1963 Methods of test for determination of insulation resistance of solid insulating materials

2260-1973 Preconditioning, conditioning and testing of solid electrical insulating materials (*first revision*)

2448 (Part I)-1963 Adhesive insulating tapes for electrical purposes: Part I Tapes with cotton textile substrates

2448 (Part II)-1968 Adhesive insulating tapes for electrical purposes: Part II Tapes with PVC substrates

2464-1963 Built-up mica for electrical purposes

2584-1963 Method of test for electric strength of solid insulating materials at power frequencies

2824-1975 Method for determining the comparative tracking index of solid insulating materials under moist conditions (*first revision*)

3202-1965 Code of practice for climate proofing of electrical equipment

3353-1966 Varnished cotton cloth and tapes for electrical purposes

3396-1979 Methods of test for volume and surface resistivities of electrical insulating materials (*first revision*)

3765-1966 Varnish impregnated cotton sleevings for electrical purposes

4248-1967 Non-ignitable and self-extinguishing boards (with mineral base) for electrical purposes

4249-1967 Classification and methods of tests for non-ignitable and self-extinguishing properties of solid electrical insulating materials

4486-1967 Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths

4819-1968 Thin vulcanized fibre sheet (including leatheroid) for electrical purposes

4820-1968 Vulcanized fibre sheets for electrical purposes

5596-1970 Method of test for determining deleterious substances in fibrous insulating materials

5711-1970 Vulcanized fibres rods and tubes for electrical purposes

6230-1970 Woven asbestos tape for electrical insulating purposes

6659-1976 Electronic grade ceramic materials (*first revision*)

7084-1973 Bitumen based filling compounds for electrical purposes

7571-1974 Methods of tests for ceramics for telecommunication and allied purposes

7755-1975 High tension insulating cotton tape impregnated with bitumen-based compound

IS:

7809 (Part I)-1975 Pressure sensitive adhesive tapes for electrical purposes: Part I General requirements

7809 (Part II)-1977 Pressure sensitive adhesive tapes for electrical purposes: Part II Methods of test

7809 (Part III/Sec 1)-1977 Pressure sensitive adhesive tapes for electrical purposes: Part III Requirements for individual materials, Section 1 Plasticized polyvinylchloride tapes with non-thermosetting adhesive

7809 (Part III/Sec 2)-1981 Pressure sensitive adhesive tapes for electrical purposes: Part III Specifications for individual materials, Section 2 Polyester film tapes (PETP) with thermosetting adhesive

7809 (Part III/Sec 3)-1981 Pressure sensitive adhesive tapes for electrical purposes: Part III Specifications for individual materials, Section 3 Requirements for polyester film tapes (PETP) with non-thermosetting adhesive

7809 (Part III/Sec 4)-1977 Pressure sensitive adhesive tapes for electrical purposes: Part III Requirements for individual materials, Section 4 Cellulosic paper, creped with thermosetting adhesive

7809 (Part III/Sec 5)-1977 Pressure sensitive adhesive tapes for electrical purposes: Part III Requirements for individual materials, Section 5 Cellulosic paper with thermosetting adhesive

8264-1976 Air-drying and anti tracking insulating varnishes for electrical purposes

8504 (Part I)-1977 Guide for determination of thermal endurance properties of electrical insulating materials: Part I Temperature indices and thermal endurance properties

8516-1977 Methods of test for determining electrolytic corrosion with insulating materials

8570-1977 Presspaper for electrical purposes

9299 (Part I)-1979 Insulating materials based on built-up mica or treated mica paper: Part I Definitions and general requirements

9299 (Part II)-1979 Insulating materials based on built-up mica or treated mica paper: Part II Methods of test

9299 (Part III/Sec 1)-1979 Insulating materials based on built-up mica or treated mica paper: Part III Specification for individual materials, Section 1 Rigid mica material for commutator separators

9335 (Part I)-1979 Cellulosic papers for electrical purposes: Part I Definitions and general requirements

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N=1kg. m/s^2
Energy	joule	J	1 J=1 N.m
Power	watt	W	1 W=1 J/s
Flux	weber	Wb	1 Wb=1 V.s
Flux density	tesla	T	1 T=1 Wb/m^2
Frequency	hertz	Hz	1 Hz=1 c/s (s^{-1})
Electric conductance	siemens	S	1 S=1 A/V
Electromotive force	volt	V	1 V=1 W/A
Pressure, stress	pascal	Pa	1 Pa=1 N/m^2

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